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VII.—*Report on the Route from Tajurra to Ankóbar, travelled by the Mission to Shwá, under charge of Captain W. C. Harris, Engineers, 1841 (close of the dry season). By Assist. Surgeon R. KIRK, Bombay Establishment.*

May 17th, 1841. Tajurra. Water good and plentiful; forage scarce.

The mission left Aden on board the H. C. brig *Euphrates*, on the 15th of May, 1841, at noon, and reached Tajurra on the morning of the 17th of May, the passage having occupied 42 hours.

Tajurra, situated on the northern shore of the extensive Bay of Tajurra, in lat. $11^{\circ} 46' 35''$ N., and long. $43^{\circ} 0' 20''$ E., is a Dankali town, the residence of Sultan Mahomed, a chief of the Adal tribes. It contains about 300 houses, composed of wooden frame-works covered with matting; and has a population of 1200 or 1500 inhabitants, principally engaged in the trade in slaves and salt with the markets of Aussa and Abyssinia. There is no bazaar at Tajurra, but the smaller supplies can be obtained in exchange for beads, buttons, fish-hooks, or tobacco. The anchorage is very limited and insecure during the S.W. monsoon; a plentiful supply of water of good quality is obtained from a well to the N.W. of the town, near a group of date-palms; there is no cultivation in the vicinity, and grass or forage for horses is very scarce and obtained with difficulty.

In the immediate neighbourhood of Tajurra are cliffs of coral growth, succeeded by rounded limestone hills, the horizon being bounded by a peaked range of basaltic formation, the district between the hills and shore being clothed with a low acacia jungle.

The climate during the latter portion of the month of May was very warm, the therm. ranging from 96° to 98° , but rendered less oppressive by the sea-breeze, which generally sets in about 11 A.M.

30th.—Anbábo, 4 miles, S.W., $1\frac{1}{2}$ hour. Road good; water abundant in pools in the bed of a stream from the hills; forage, short grass near the margin of the stream.

The road to Anbábo runs either on, or parallel to, the beach; our encamping ground was on the bank of a small mountain stream, about 1 mile to the eastward of Anbábo, which is a small Dankali village, situated near a group of date-trees.

June 1st.—Dullul, 7 miles, S.W., $2\frac{1}{2}$ hours. Road good; water abundant, from wells; forage, short grass, on plain.

The road from Anbábo is very good, running over the sandy beach. Dullul is a Bedawi encampment, near some wells, situated at the abutment of a spur from Jebel Gudah, of trachyte formation. Therm. max. 96° in tent.

3rd.—Sagallo, $2\frac{1}{2}$ miles, S.S.W., 1 hour. Road good; water abundant, from wells; forage scarce.

The road passes along the beach; 1 mile from Dullul we passed the wells of Suktá. Sagallo being the last station at which water can be obtained before passing the Salt Lake, halted one day to fill the water-skins. Therm. max. 96° .

5th.—Wárdelihán, 14 miles, S.W. and W., 6 hours. Road, after leaving beach, difficult and pebbly.

For the 4 first miles the road passed to the S.W. along the beach, and then struck off to the westward, over low undulating hills covered with basaltic boulders, forming a very bad road for mules and camels. 7 miles from Sagallo we came to the narrow ravine of Gulalafu, about $\frac{1}{2}$ mile long, 60 to 80 feet in breadth, and bounded by precipitous cliffs about 150 feet high. This pass opens into a hilly table-land, traversed by an extensive valley, running up to Jebel Gudah, crossing which, after a march of 14 miles, we reached the halting-ground of Wárdelihán, situated on a barren pebbly plain, affording neither water nor forage. Height above the level of the sea by means of barom. and therm. observations, 1697 feet; notwithstanding which elevation, the climate was scarcely less oppressive than in the lower country.

6th.—Muyà, near Salt Lake of Asal, 16 miles, S., afterwards westerly, 8 hours. Road exceedingly difficult, impassable for wheeled carriages.

On leaving Wárdelihán the road suddenly descends into the Pass of Raizán, a most formidable ravine; the path for $2\frac{1}{2}$ miles is bound in by precipitous cliffs of basalt of several hundred feet elevation, being in parts exceedingly steep, and obstructed by large fallen masses of rock. The pass then merges into a narrow valley, which descends for 2 miles to the southward, opening on to a plain of black lava, extending to the shores of Gubat-el-Kheráb. The road after leaving the valley passes to the N.W., along the foot of a low range of hills, at the end of which the lofty peak of Searo, with the Bahr Asal (Salt Lake) at its base, comes into view; then passing over 8 miles of volcanic country, a limestone substratum occasionally showing through the sheets of lava, we came to a precipitous path down a lava cliff, of about 100 feet elevation, exceedingly steep and difficult for laden camels, descending which, we arrived on the sandy plain of Muyà, and encamped about a mile from the margin of the lake.

By observations taken by Lieut. Christopher, I.N., the S.E. shore of the lake near this station was determined to be in lat. $11^{\circ} 38' 12''$ N., and long. $42^{\circ} 33' 6''$ E., and the mean of bar. and ther. observations gave a depression of 570 feet below the level of the sea. The Bahr Asal is of an oval form, about 7 miles across in its longer diameter, which runs from N.E. to S.W.;

about one-third of its surface is covered with a level sheet of salt; it is shut in on its northern, western, and southern shores by ranges of mountains; whilst on the eastern side a bed of lava, containing several deep craters, separates the waters of the lake from Gubat-el-Kheráb, of which it appears to have once been a continuation. From this lake the Danákil traders procure the supply of salt, which they convey to the markets of Aussa and Shwá.

The climate at this station was most oppressive, a hot simoom from the N.E. blowing during the greater part of the day, the ther. in the shade rising to 126°. Our supply of water being exhausted, it was determined to make a night march to the next station, leaving the baggage to follow.

7th.—Gungunta, 16 miles, W.S.W., 10 hours. Road very difficult; water plentiful, but brackish; forage, a little grass on margin of stream.

We started on the rising of the moon, at 11 P.M. The path along the shore of the lake being nearly impassable for cattle from the rugged and brittle nature of the lava sheets, we took the upper road, and crossing the Muyà plain, passed in a south-westerly direction over successive ranges of lava hills, in some parts exceedingly steep and difficult, in others winding along the valleys between them, or near the margin of the lake. Suffering most severely from the oppressive heat of the night, and intense thirst, we at length reached the Well of Haulefanta, in a small rocky nook, distant about 10 miles from Muyà. We there passed to the margin of the lake, and over the salt plain at its S.W. extremity for 2 miles, then crossing a low range of hills we descended into the dry pebbly bed of a river, which in the rainy season, rising from Alluli, at the highest point of the Gallo range, flows into the S.W. corner of the Bahr Asal. Proceeding for a mile up the bed of the river, which runs through a narrow valley, we came to a small stream of running water, and shortly afterwards reached the halting-ground of Gungunta, where the valley is shut in by precipitous and lofty cliffs of basalt and porphyry. We passed a very hot day in some caves formed by the fallen masses of rock from the mountain. The ther. rising to 110°.

8th.—Many of the camels of the kafila not having arrived from Muyà, we halted this day, and at night two European soldiers of the escort and a Portuguese cook were murdered in their sleep by some of the mountain Bedawi in the neighbourhood.

9th.—Alluli, 9 miles, S.W., 4½ hours. Roads in parts difficult and rocky; water plentiful, but saltish; forage, a fine grassy patch at head of stream.

Left Gungunta at 9 A.M., the road passing in a W. and S.W. direction through the Wadi Kallu, which intersects the Gallo range: ¼ of a mile from camp the camels had to ascend a most diffi-

cult steep, a rude road having been constructed up the face of a steep rock; the road then became comparatively easy, winding through a narrow ravine faced with precipitous rocks of basalt, water being plentiful the whole way; and we passed several green grassy spots, and an occasional group of palm-trees. As we proceeded, the hills decreased in altitude; and after a march of 9 miles we reached the head of the stream, at a small grassy plain called Alluli, where we halted under a clump of doom palm-trees.

By ther. observations Alluli was found to be 228 feet above the level of the sea. So much mercury had leaked from the barometers, owing to the extreme heat they had been exposed to, that no reliance could be placed on their indications; and subsequently in the course of the journey their tubes were broken, notwithstanding every precaution in their carriage.

10th.—Several camels not having arrived, and this being a good spot to recruit, our cattle halted for the day.

11th.—Bedi Kurnoff, 16 miles, S.W. and S., $6\frac{1}{2}$ hours. Road good; water in pools, brackish; forage scarce.

Started at $\frac{1}{2}$ past 1 A.M., and passed to the S.W. for 3 miles over low rounded hills and small barren plains; the road then opens on to the extensive plain of Gagade, about 8 miles in breadth, and bounded to the N.W. and S.E. by distant ranges of mountains. From hence the caravan route to Aussa branches off, running up the valley to the N.W., said to be 3 days' journey for a kafila. Our road crossed the plain to the southward, and passed for the first 2 or 3 miles over a surface of hardened and cracked alluvial deposit, much resembling the deserts of Upper Scinde. We then passed through a thin jungle of acacia and a species of spartium, and near some low hills, on the southern side of the plain, came to the dry pebbly bed of a stream, which, dividing into two branches, expends itself on the plains. Leaving Gagade and following the bed of the river, the road enters a small valley in which we found some pools of bitter and undrinkable water; we shortly afterwards reached the station of Bedikurnoff, and pitched our camp on a small stony hill, above a wooded hollow, in which water was found, but of a brackish taste.

12th.—Saggadereh, 8 miles S.W. and S.E., $3\frac{1}{2}$ hours. Road good, in parts stony; water in pools, brackish; forage scarce.

Started at 3 A.M.; the road for the first 2 miles passing over low stony hills, we then entered the Wadi Kurri, a most verdant-looking valley from 200 to 300 yards in width, and studded with low palm-bushes, tamarisks, and acacias, whilst we passed frequent flocks of goats grazing, under the charge of women and children, and at every turn of the road we saw groups of the inhabitants assembled on the edge of the hills watching our progress. The hills bounding the valley were of no great elevation, being

composed of basaltic and porphyritic rocks, with occasionally conglomerate and sandstone. After a march of 8 miles reached the halting-ground of Saggadereh, near the head of the valley. Ther. max. 110° in tent; lat. of Saggadereh $11^{\circ} 19' 5''$ (Lieut. Barker's obs.)

13th.—Marha, 4 miles S.E. and W., 2 hours. Road stony; water good, but distant; forage scarce.

Started at $\frac{1}{2}$ -past 5 A.M.; the road leaving the wadi, and passing over a low hilly country, and then for a mile over a stony plain thickly covered with basaltic pebbles, when we reached the halting-station of Marha, near the foot of a low range of hills. The surrounding country was of the most dreary aspect, fields strewn with boulders of lava and basalt met the eye on all sides, with scarce a trace of vegetation. A lofty range of hills was pointed out to the westward, distant about 15 miles, behind which Aussa was said to be situated. Our supply of water was obtained from pools 2 miles distant. Ther. 109° ; lat. of Marha $11^{\circ} 17' 6''$ N.

14th.—Daduh, 15 miles southerly, 8 hours. Road stony; water in pools, bed of river; forage plentiful.

Marched at $\frac{1}{2}$ -past 2; ascended the low range, and reached the summit of a table-land, the same dreary wilderness as yesterday, the country being completely strewn with rocks and boulders of lava, with, however, a few patches of coarse grass, a most welcome sight for our exhausted cattle. We crossed the plain for 6 miles in a southerly direction, and then descended into a small level spot surrounded by low rounded hills, and soon after entered the fine level plain of Galamo running to the N.W., crossing which we came to the broad dry bed of a stream called Chaikaito, in which there were marks of the water at times rising to the height of 12 or 15 feet; it is formed by the junction of two streams, one rising from the S.E. range of mountains, the other from the Góbád plain; it is stated in the rainy season to flow into the lake formed by the Hawash at Aussa. Passing along its western branch, we shortly entered the small valley of Ambaido, thickly wooded and abounding with grass; afterwards crossing a grassy plain, on which four ostriches were seen, we again descended into the valley, and encamped at a station called Dadah, near the bed of the river, in which water was found on digging. Ther. at sunrise 83° , at 3 P.M. 111° .

A road to Zeila is said to branch off here, being 4 days' journey: the road being good, and water plentiful.

15th.—Góbád, 12 miles southerly, $6\frac{1}{2}$ hours. Road good, but in parts stony; water abundant; forage abundant.

Started at $\frac{1}{4}$ -past 3 A.M.; the road running S.S.W. across the level sandy plain of Kumodali, abounding with coarse grass. We here saw the first cone of the termites. Passing over the plain

for 5 miles, we came to a low hill, which we ascended, on to a second slightly elevated track, over which the road ran for 3 miles; we then descended a ridge of lava-rock, on to a grassy plain; crossing this we came to some ridges of lava, and then descended into the plain of Góbád, and encamped near the bed of its river. The valley of Góbád appears to extend from 10 to 12 miles to the westward; to the S.E. it is more shut in by hills; its elevation above the level of the sea was found to be 1057 feet, and observations made by Lieutenant Barker place our halting-spot in lat. $11^{\circ} 0' 56''$ N.

16th.—Halted.

17th.—Sunkul, 4 miles S.W., 2 hours. Road stony and rough; water in wells, good; forage scarce.

Started at $\frac{1}{2}$ -past 6 A.M.; crossed the plain, and ascended the range to the S., then passed over a stony plain covered with basaltic pebbles, and descended into a small valley, in which were some wells of good water; proceeding $\frac{1}{2}$ a mile further, encamped at the station of Sunkul, after a short march of 4 miles. Ther. at max. 108° .

18th.—Sugagedan, 7 miles southerly, 3 hours. Road level, but stony; water none; forage plenty.

Started at 6 A.M.; ascended from the Sunkul valley, which seems to be the focus of several smaller valleys, on to the table-land of the Hudali range, the road running S.S.W. over an extensive stony plain thickly studded with grass, and much resembling the plains of the Deccan. Having passed 4 miles, saw goats at a short distance to the eastward, which we were told were near the encamping ground of Arabdereh. After 2 more miles, we came to the brow of the Hudali range, commanding a fine view over the Dulul valley, which is about 6 miles in breadth, running N.W. and S.E., being the direction in which I have found all these plains to extend. To the S. it is bounded by the Mari range, which forms a high table-land, with a steep sloping and in parts precipitous face. Descended the hill, a height of about 200 feet, and then skirting its base for a mile to the S.E. halted on the plain, at Sugagedan, near the edge of a tract of lava-boulders. Found abundance of grass, but no water. Lat. of Sugagedan, by Lieut. Barker's observations, $10^{\circ} 53'$ N.; ther. at sunrise 84° , and at 3 P.M. 108° in tent.

19th.—Dawaileka, $9\frac{1}{2}$ miles westerly, 4 hours. Road good; water abundant and good; forage plentiful.

Crossed the Dulul plain in a W.S.W. direction, a perfect level, covered with coarse grass. On the march saw a herd of twelve wild asses; after passing over $8\frac{1}{2}$ miles, came to a dell in the Mari range (which is here about 1000 feet high), in which we found an abundant supply of good water. Having filled up our

skins, proceeded a mile to the westward to a small open space, where we encamped. By the boiling-point of thermometer, the Dulul plain at Dawaileka was found to be 1228 feet above the level of the sea. Ther. at sunrise 86° , at 3 P.M. 107° in tent.

20th. — Umarguluf, $8\frac{1}{2}$ miles W.N.W., $3\frac{1}{2}$ hours. Road good; water none; forage plentiful.

At daybreak returned to the pool in the dell to fill our water-skins, none being procurable at our next station. We then skirted along the foot of the Mari range in a W.N.W. direction, the plain for about 6 miles being a perfect desert. We then came to a grassy tract, in which a few antelopes were grazing, passed a small detached hill, and soon after entered a jungly patch, near which we halted, at a spot called Umarguluf; the plain is here divided into two valleys, the southern one taking the name of Wadi Arfa, up which is a caravan-route to Aussa, passing over the Ubnu range in a W.N.W. direction, said to be 2 days' journey for a kafilá. The Mari range at this point is about 1000 feet high, basaltic, and its base strewn with huge blocks that have become detached from its face. Saw here a fine effect of the *mirage*, the plain resembling an extensive lake, with the projecting points of the mountain forming deep bays and headlands. Ther. at sunrise 87° . In the evening the sky became darkly clouded, and we were in hopes that rain would accompany it and diminish the extreme heat of the weather; it proved, however, to be a hot simoom from the N.E., bringing with it clouds of dust.

21st. — Amadu, $7\frac{1}{2}$ miles W., 4 hours. Road good in plain, afterwards stony; water plentiful, good; forage plentiful.

Started at $\frac{1}{2}$ -past 3 A.M.; the road as yesterday skirting the foot of the Mari range to the westward, the desert tract extended for 3 miles, and we then entered on stony ground, thickly strewn with rounded masses of basaltic rock, apparently the *débris* of the neighbouring hills; at $4\frac{1}{2}$ A.M. we came to a road over the hill, which is here much diminished in height; ascended and crossed the hill, the path winding amongst blocks of lava and basalt, rendering the road so bad that the camels proceeded by a more circuitous route round the abutment of the range. Having crossed this lava-ridge, we had an extensive view over the plain of Amadu, running parallel to and bounded to the N. by the Mari chain, to the W. opening into the Wadi Arfa, and to the E., at the distance of 5 miles, divided into two valleys. Crossing the plain for 2 miles, we came to a fertile patch under the opposite hill, where in a rocky nook we found a fine pool of good water, at which herds of cattle, with numerous donkeys and flocks of sheep, were being watered; during the scarcity of water in the surrounding districts this seeming to be a favourite encampment with the neighbouring tribes. Ther. max. 106° .

22nd.—Koranduduk, $3\frac{1}{2}$ miles, S.W., 2 hours. Road stony; water abundant and good; forage scarce.

Started at $\frac{1}{2}$ past 5 A.M.; our road passing to the W.N.W., over a low hill into a stony table-land, covered, as usual, with basaltic boulders: passing which table-land, for 2 miles, we came to a small desolate hollow, in which were 4 mat-huts, inhabited by goatherds. We crossed it, for $\frac{1}{2}$ a mile, to a narrow precipitous ravine, a short distance up the bed of which we found a fine pool of water, at which we watered our cattle; then returning to the hollow, ascended the hill, and proceeding $\frac{1}{2}$ a mile, encamped on a small dreary plain, covered with lava pebbles, called Koranduduk. To the southward the view is scarcely more promising; with the exception of a few acacia bushes at Fialu, and a bathing-place about a mile distant.

Ther., daybreak, 85° ; 3 P.M., 106° . Height above level of the sea 1605 feet.

23rd.—Halted.

24th.—Barudega, 15 miles, S.W., 7 hours. Road good; water none; forage scarce near encampment.

Marched at $\frac{1}{2}$ past 3 A.M.; passed over rocky, broken ground for $1\frac{1}{2}$ mile; then entered on the extensive sandy plain of Killele: crossed it to S.W., the road skirting along the foot of a low undulating range of hills to the westward (the termination of the Eysa range). This is the most extensive plain we have as yet seen—the horizon being bounded only by the blue ranges of mountains 20 or 30 miles distant; the whole tract apparently covered with parched grass. After a march of 15 miles, over an excellent level road, reached the halting-ground of Barudega; the plain in the vicinity thickly strewn with basaltic pebbles. A high peak, called Kuffal Ali, S.S.E., and apparently forming a head-land, extends into the plain. Ther. 108° . At night the sky appeared very overcast and stormy, and a few drops of rain fell.

25th.—Killele, 12 miles, S.W., $5\frac{1}{2}$ hours. Road over plain good, afterwards stony; water abundant; forage rather scarce.

Marched about 4 A.M., and continued, as yesterday, to skirt the range to the westward; the road, after a mile, becoming shut in by a similar low range to the E. After crossing the plain, 7 miles, the road passed up a bushy ravine, and then wound over low rocky hills for 3 miles. We passed many herds of cattle and sheep on the road, all proceeding in the direction of Killele; and, on reaching the brow of the last hill, long white streaks of sheep and goats were seen descending the sides of the opposite mountain; whilst the lowing of cattle and bleating of sheep rose from the ravine, in which water is found: it was in pools of 30 or 40 feet in length, but muddy and defiled by the thousands of cattle watered at them; as this station at present appears to contain an

assemblage from all the tribes, driven here by the failure of water in the plains.

Killele, by Lieut. Barker's observation, is in lat. $10^{\circ} 34' 33''$ N.; and, by the boiling-point of water, I found its height above the level of the sea to be 1542 feet.

Killele is a narrow ravine, bounded by basaltic cliffs of from 800 to 900 feet elevation; to the W. steep and precipitous, but of less height and easier of descent on the E. It appears to be the point to which the waters from the Killele and Gayel plains, and some of the mountains of the Galla tribes, flow in their course to the lower country near the Hawash and Aussa, in which direction the Killele Wadi appears to extend: Aussa being said to be 3 days' journey to the N. for a kafila; Hurrar was also stated to be 3 days' journey distant for a messenger. Ther. 108° .

27th.—Slight rain at night.

28th.—P.M., sky very cloudy; and heavy rain set in about 8 P.M.

29th.—Ther., sunrise, 77° ; max. 94° . No rain; night very cloudy. Were detained at Killele 5 days, owing to the disputes between the leaders of the kafila and the native chiefs assembled at the watering-place. At length everything was settled.

30th.—We once more resumed our journey. The usual route taken by kafilas passes over the hill on the S.W. side of Killele, and emerges into the plains to the S. of Jebel Abida, at Ras Mittur; but water was reported to be so scarce along this road that our guides determined, after long deliberation, to take the Badu route, which, crossing the Pfió range, passes to the northward of Jebel Abida to the banks of the Hawash; though they stated it was so unsafe, from the predatory habits of the Mudaitus, through whose country it passes, that it had not been travelled by kafilas for several years.

Warimilli, 7 miles, N.W. and S.W., 3 hours. Road stony; water good, but distant; forage plentiful.

We started at 7 A.M., the road passing to the north-westward, up the Killele wadi, in which we saw several fine pools of water. Leaving the course of the valley, we then struck over low undulating hills, plentifully strewn with the common pest of this country, stones, amongst which we found numerous fragments of obsidian. After a short march of 7 miles, during which the country ascends considerably, we descended into a small open plain surrounded by low hills, where we encamped. Warimilli, our present station, was found, by the boiling-point, to be 1752 feet above the level of the sea. Water was only procurable from the Killele wadi, distant $1\frac{1}{2}$ mile; in which, during the rainy season, crocodiles are said to be found. Very stormy and blowing to-night, but no rain.

July 1st.—Halted to-day, the men having been sent to report

on the water in advance: reported very unfavourably. No rain at night.

2nd.—Nagakumi, 15 miles, S.W., 7 hours. Road good; water none; forage plentiful.

Started at 6 A.M., passing to the westward and S.S.W., over low stony hills, on which we saw several flocks of sheep grazing; then came to a cluster of small beehive-shaped mat-huts, and descended into the small valley of Dumi, running N.N.E. and S.S.W.; passed along its course for 2 miles, when, ascending its western bank, we came on a level table-land, covered with dry grass, and extending for a great distance to the E. and W. Crossed the plain to the W.S.W. for 5 miles, when we came to a small projecting hill, having a cluster of huts on its summit; and then passing another mile to the westward, encamped at Nagakumi, under a second low point. No water to be found; but the whole face of the country was covered with dry parched grass. A range of peaked mountains in sight, called Jébel Pfió, extending from the N.W. to S.W., and distant about 12 miles. 4 P.M., a heavy shower; at night, much lightning to the southward, but little rain.

3rd.—Meinhatolli, 15 miles, S.S.W., 8 hours. Road stony; water in pools; forage abundant.

Our guides having learnt that, owing to the rain, water would be found on the southern road, determined to strike into that route from this station. Started at $\frac{1}{2}$ past 5, passed to the westward for a mile, over broken jungly ground, when the hills closed in, and our road ran through a narrow valley, abounding with grass and verdant-looking bushes; ascending from the valley to the westward, our path led to the S.S.W., over a jungly and stony plain: the whole country basaltic, and the ground strewn with fragments of obsidian. At 10th mile came to a green fresh-looking patch of bushes at Arnut, where herds of cattle were grazing in the neighbourhood of some muddy pools of water: after watering the mules we again resumed our journey, and soon entered a long narrow valley, bounded by low sloping hills, which, with the bed of the valley, was thickly clothed with dry grass; proceeding through this for 5 miles, we encamped at Meinhatolli, a halting-place near some pools of muddy water; whilst, on the surrounding plain, numerous herds of cattle were grazing. Owing to the late falls of rain, and the elevation of the country (about 2000 feet), we have found the climate, for the last few days, much less oppressive. 7 P.M., heavy rain, with severe gusts of wind, continuing for about 2 hours. The lofty ranges of Abyssinia were distinctly visible from this station.

4th.—Madera Dubba, 15 $\frac{1}{2}$ miles, S.S.W., 9 hours. Road good; water none; forage abundant.

Started about 5 A.M. Having passed a mile through the valley, we emerged into the fine plain of Mirihan, bounded to westward, at a distance of about 10 miles, by the lofty peaked range of Pfis; to the eastward by the sloping Bundura range, at the foot of which our road ran the whole day; it varies in height from 600 to 1000 feet, its sides being thinly clothed with grass; 5 miles from camp to a small detached hill of compact limestone, containing impression of small spiral shells, the surrounding rocks being, as usual, a cellular basalt. The plain of Mirihan is a fine light-coloured soil, thinly strewn with pebbles; the grass much improved by the late rain, and acquiring a greenish tint. At 9th mile came to a ravine, being the opening of the Wadi Bundura, from which a small nulla issues and runs through a patch of verdant bushes: water was expected to be found here, but every pool was dry, and we had to continue our journey. A low range commenced near here, which at a mile to the westward formed a small valley. Another 5 miles brought us to a second clump of bushes, near a nulla called Madera Dubba; no water was to be found; but, having marched $15\frac{1}{2}$ miles, and the heat becoming oppressive, we pitched our camp. In the evening the sky clouded over, and we had several very heavy and most welcome showers, with much lightning.

5th.—Sultulli, 17 miles, S.S.W., 8 hours. Road good; water none; forage scarce.

Started at 3 A.M., and passed in a S.S.W. direction, the valley after 2 miles opening into the plain of Eyroluf. At the 7th mile came to a small black lava hill, at the entrance of Wadi Kudaiti; it is the termination of a long low range extending to the Afraba Mountains, which were dimly seen to the S.S.W. From this hill we had an extensive view over the surrounding country, which bore a most interesting volcanic character; to the westward was the lofty volcano of Abida, about 4000 feet in elevation, having a very extensive crater opening to the N.W., behind which was seen the higher peak of Aiullo (?), partly hid by clouds, and at their base numerous smaller cones scattered irregularly over the plain; to the S.E. the Kudaiti valley was seen winding to the distant mountains of the Galla country. Continuing our course, we crossed a deep dry nulla, bordered with a green bushy jungle, in which we saw a hog and some guinea and spur fowl, and a few quail were found in the surrounding grass. Passing over a fine open grassy plain, at the 11th mile we came to a few stone sheep-pens. At 13th mile reached a singular conical hill, called Jebel Helmund, towards which our course had been directed since leaving Madera Dubba: it proved to be a volcanic cone, about 400 feet in height, the crater opening to the N.E., its base being surrounded by a belt of black rugged lava, forming a wall from

15 to 20 feet high, the crevices of which abounded with guinea-fowl. Passing round the lava left to the eastward, we came in sight of a most remarkable plain, apparently extending to the base of Jebel Abida. It was entirely covered with low shrubs, giving it a peculiar pale green tint, much resembling a lake covered with duckweed. During the greatest part of the year it is a sheet of water; and our guides here expected to find a supply, but were disappointed, and we were doomed to rest contented with the nauseous contents of the skins filled at Meinhatolli. Crossing for a mile, we encamped at Sultulli, near the foot of the low range of hills to the eastward.

The country in this neighbourhood is of a most interesting character, the lofty mountains of Abida and Aiullo (?) forming the centre of an extensive volcanic tract, from which sheets of lava have descended on all sides to the plain, forming a field of volcanic matter about 30 miles in diameter, studded with small cones, each showing an extinct crater, of which I counted as many as twenty-one from one point of view. The surface of the lava appeared fresh and glossy; but we could not learn that any tradition existed amongst the tribes in the neighbourhood of their having been in an active state. Heavy rain at night set in at 9 p.m.

6th.—Murro, 13 miles, W.S.W., $5\frac{1}{2}$ hours. Road good; a small lake of excellent water; forage rather scarce.

The tents and baggage had become so wet and heavy from last night's rain, that we were not able to start before noon. Having proceeded $3\frac{1}{2}$ miles along the base of the Kumi range of hills (and passed within 2 miles of a small volcanic cone), we entered the plain of Mittur, a bare alluvial deposit resembling the Scinde Deserts, and arrived at a few babool trees of small height, but still almost the first vegetation exceeding a bush we had seen since leaving Tajurra. This point is called Ras Mittur; and here the two roads from Killele join. From this point the road strikes off from the hills, which continue in a south-south-westerly direction, to Jebel Afraba, and passes across the plain in a W.S.W. direction, having the edge of the lava field about 3 miles to the N., passing over a fine grassy plain, with but few stones. At $8\frac{1}{2}$ miles from Sultuli came to a low black lava hill, near which a fine herd of milch camels were grazing; and, 2 miles beyond, reached a small group of about twenty Bedawi huts: from this point the lava plain trends away to the north-westward. At the 11th mile came to a small patch of jungle; passing through which we again came to the open plain, which was studded with flocks of sheep and goats; proceeding $\frac{1}{2}$ a mile, we arrived at the small lake of Murro, which was about $\frac{1}{4}$ mile in diameter, and surrounded by low stony hills. The water was very clear and good, but the lake apparently of no great depth, its centre being full of

leafless bushes, and its surface covered with wild-duck and several varieties of water-fowl. Cool pleasant day, with heavy rain at night.

7th.—Mullu Sugere, 13 miles, W.S.W., 6 hours. Road good; water in nulla; forage plentiful.

Started at 11 A.M.; the road passing in a W.S.W. direction across the Mullu plain, which is here about 20 miles broad, bounded to the N.W. by the Berdude range, and to the S.E. by the Kumi hills; it is a fine level tract, covered with grass, and studded with a variety of verdant bushes, with occasionally a fine cedar-like camel-thorn acacia. The scenery was very fine when, through an open glade, the view was extended to the blue peaked mountains near Afraba. The plain abounded with game, several varieties of antelope, some fine beizee, guinea-fowl, spur-fowl, hares, quail, bustard, and florican. At the 12th mile we came to some small muddy brooks, running to the northward, which the water had just reached from the Afraba hills. Our guides said that in a few days later the plains in this part would become a perfect swamp, nearly impassable for camels. Passing a fine green patch of grass, and proceeding another mile, we halted on a fine open spot near a large termites' nest. This camp was called Mullu Sugere, to distinguish it from a halting-ground more to the S. called Mullu, situated on the same water-course. No rain at night.

8th.—Berdude, 9 miles, W.S.W., 4 hours. Road good; water abundant; forage abundant.

Started at $\frac{1}{2}$ past 4 A.M., and proceeded W.S.W. in the direction of a small barn-shaped hill, situated at the termination of the Berdude range. At the 3rd mile crossed the bed of a small stream; and at the 6th mile came to a group of graves enclosed in a thorn fence; and shortly after reached the barn-hill, passing which we came to the grave of Sheik Othban (?), a spot much revered by our Bedawi escort. Proceeding 2 miles further, we arrived at some fine pools of excellent water in the Berdude wadi, near some picturesque camel-thorns, and encamped on a rising ground above. From this station the mountain-range of Abyssinia was very distinct to the westward. Therm. at sunrise 68° ; at 3 P.M. in a tent, 105° . Day cloudy, but no rain at night.

9th.—How, 15 miles, S.W. and E., $6\frac{1}{2}$ hours. Road good; water, none; forage excellent.

Started at 5 A.M.; passed over low hills for $1\frac{1}{2}$ mile, and then descended into the Halakdiggi Kebir plain, a continuation of the Mullu, but extending round the western sides of Jebel Aiullo (?) and Afraba. The plain is an alluvial level covered with grass, and, having but a thin sprinkling of scrubby bushes, without trees; crossed it for about 11 miles, passing a few antelopes and beizees,

and a herd of zebra; and our camel-men killed a leopard with their spears: we then came to a sloping bank of about 30 feet, and descended into a hollow called the Halakdiggi Sugere, about $2\frac{1}{2}$ miles broad, its surface perfectly level, and covered with fine grass, and bounded by a similar bank on the western side. It ran N. and S. as far as the eye could reach, and had every appearance of having formerly been the bed of a considerable river. One of our guides called this valley the Hawash Kebir (large Hawash), but had no tradition accounting for the name.

We here saw a herd of wild asses. Crossing the plain, we ascended its western bank, and passed over three several terraces, each rising about 50 feet, and descended from the last into a confined valley, called How, where we encamped. The hills composing this part are of wacke formation, and passing in northerly and southerly direction from the eastern boundary to the valley of the Hawash, across which we had a fine view from the summit of a neighbouring hill: we could not see the river, but its course could plainly be traced by the belt of trees on its banks, beyond which appeared an open country but thinly wooded, extending to the foot of the Abyssinian mountains. Heavy rain at night, with thunder and lightning. Lat. of How, $9^{\circ} 39' 13''$ N.

10th.—Hawash River, 11 miles, S.W., 4 hours. Road good; water abundant and clear, from lake; forage abundant.

Started at 6 A.M., and descended the face of the hill in a S.S.W. direction, passing for 3 miles over several terrace plains; we then reached the level of the valley of the Hawash, which we crossed to the S.W. $\frac{1}{2}$ W. for 6 miles, the latter part of the road being very winding, from the thickness of the jungle.

As we approached the stream the country became thickly wooded with a variety of timber trees, but none of any great size; amongst them were some fine specimens of the camel-thorn. On the ground we found marks of the rhinoceros and elephant; the dung of the latter was very plentiful, and the shattered branches of the trees bore evidence to their visits. After a march of 11 miles we encamped near a low hill on the banks of the river, 2223 feet above the level of the sea. With the Hawash itself we were much disappointed; its breadth did not exceed 40 or 50 yards, and its muddy stream, which ran at the rate of 3 miles an hour, was about 10 to 12 feet deep: its banks were about 20 feet above the surface of the stream; and our guides stated that after heavy rains the level country on either side is overflowed for miles. Near our camp the river took a semi-circular curve, but its general course appeared to be N. and S. from the mountainous regions of the Galla, flowing to the northward, and taking its course to the W. of Jebel Abida. From all the accounts we received, it terminates in an extensive lake near Aussa, most probably interrupted

in its course to the Bahr Assal and Bay of Tajurra, at the same period that volcanic action separated the waters of the salt-lake from Gubbat-el-Kheráb.

11th.—This day was occupied in transporting the baggage and camels to the opposite bank. The loads were placed on rafts, constructed from the drift timber found on the shore, under which from twelve to twenty inflated water-skins were lashed, rendering the whole very buoyant. The transit of these rafts was facilitated by means of a rope passed from bank to bank. On crossing the river we visited a small lake of clear water about $\frac{1}{4}$ mile from it; this lake was about 600 yards in its longer diameter, and contained a number of hippopotami and crocodiles, which were continually rising to the surface of the water to breathe.

12th.—Assaboti, $12\frac{1}{2}$ miles W. by N., $5\frac{1}{2}$ hours. Road good; water in nulla; forage none.

Started at 6 A.M., and passed round the northern end of the Hippopotamus Lake, near the village of Melkukun, and after traversing a mile of hilly and stony country, came to the circular lake of Hulabulu (?), prettily situated in a green hollow, with precipitous sloping banks, apparently the site of an extinct crater. Its waters were of a sulphurous and saline nature, and are in great repute with the natives for their cleansing and bleaching qualities. The road then passed over small grassy plains, shut in by conical hills of no great elevation, but of a decided volcanic character, the craters of some of them being very apparent. The neighbouring rocks, wherever they showed above the soil, were of black lava, which appeared to extend over a surface about 8 miles in diameter. At the 8th mile the lake of Le-adu came in sight, situated on the plain, and about 1 mile to the southward. Striking off the road, we proceeded to its banks; it is a pretty lake of good water, about 2 miles in diameter, bordered with a dense jungle, the resort of elephants; its margin covered with the lotus-plant, and teeming with geese, ducks, and other aquatic fowl. There was a small cluster of huts near the lake, and the women were driving down their flocks of sheep and goats as we approached; returning to the road, we passed over a bare open plain without grass for 3 or more miles, when we came to two small stone enclosures, in which from poles were suspended as trophies the stuffed heads of two lions slain in the neighbourhood some years ago; then passing a small group of huts, we at length, after a march of $12\frac{1}{2}$ miles, reached the wadi at Assaboti, in which we found a plentiful supply of water; but very little grass could be found in the neighbourhood for our cattle. From this station we had a fine view of the lofty mountains of Abyssinia, rising range beyond range, and canopied with clouds. At night had very heavy rain.

13th.—Dathura in Wadi Kokai, $12\frac{1}{2}$ miles W. by N., $5\frac{1}{2}$

hours. Road hilly; water good and plentiful; forage abundant.

Fine cool morning; started at $\frac{1}{2}$ -past 6 A.M., passed for 6 miles over the Assaboti plain, which as yesterday was nearly destitute of vegetation, and but thinly wooded, the wide-spreading camel-thorn acacia forming the most striking object in the scene; passed for a short distance along a bend of the Assaboti Wadi, and, soon after, the hilly country at the foot of the Habesh range commenced near a halting-ground called Atkonsi. Our road now passed over hill and dale, thickly wooded, with a great variety of trees, the camel-thorn, babool, and tamarind being most frequent, whilst the under surface was completely covered with the socotrine aloe-plant, which here grows most luxuriantly, and might be rendered a valuable article of commerce. At the 10th mile we came to the pebbly bed of a mountain-stream called the Wadi Kokai, running to the eastward towards the Hawásh; our road for 2 miles now passed either along its banks or through its bed, where, notwithstanding last night's heavy rain, we found no water; at times passing through narrow ravines shut in by precipitous rocks, emerging from one of which we entered on the small open space called Dathura, where we encamped, and in the bed of the stream found abundance of clear crystal water. By the boiling-point of water the height of this station above the level of the sea was found to be 2944 feet. We were here visited by the Walasma Mahomed, governor of the Mussulman provinces in the lower country, the first Abyssinian potentate we have met.

14th.—Halted.

15th.—Dinomali, 5 miles W. by N., 2 hours. Road hilly; water abundant; forage rather scarce.

Started at $\frac{1}{2}$ -past 6, escorted by the Walasma Mahomed and about 200 of his people, the road gradually ascending and passing over a hilly and wooded country abounding with the aloe-plant, and having deep valleys opening to the N. and S. At the 5th mile came to the first cultivated ground, and shortly afterwards encamped on a small open space called Dinomali, where the duties on articles arriving by the Adal kafilas are levied; during this day's march we ascended considerably, but the climate still continues very hot.

16th.—Ferri, 2 miles W., 1 hour. Road good; water abundant, but distant; forage very scarce.

Crossed a hilly tract, with occasional patches of cultivation for 2 miles to Ferri, the first village we have seen since leaving Tajurra. The houses were of a circular form, with conical roofs, and perched generally on the sides and summits of the surrounding hills; our tent was pitched on a small open space below,

where we spent a very hot day, much inconvenienced by the numerous visitors curiosity brought to the spot.

17th.—Aliu amba, 13 miles S.W., 6 hours. Road mountainous; water good and abundant; forage very scarce.

Started for Aliu amba escorted by a party of 200 matchlock-men under Aytu Katama, our baggage being carried by porters, the road being too mountainous for camels. We first passed over a low point to the S. of Ferri, and then along a valley winding to the S.W., the road at times running along the precipitous sides of its hills, and then descending into the bed of a fine mountain-torrent at their foot; the aspect of the country becoming most verdant and extensively cultivated, small villages being perched on most of the numerous peaked hills we passed. At the 5th mile passed through a gap in the range extending from Gucho, leaving the village of Aigibba on the summit of a high hill to the E., the first Christian village in Iffat, and the spot where the late Mr. Airston was interred. We then entered a triangular district immediately below Ankóbar, bounded to the N. by the rugged spur projecting from the lofty peak of Ememaret (the Mother of Grace), to the S. by a range commencing at the projecting peak of Losa, the base between the two points being about 10 miles. The road winding to the S.W. passes over a mountainous tract, traversing valleys and successive ranges of hills, and crossing the beds of two mountain-streams, the country highly cultivated, and each rounded hill being crowned with a small cluster of cottages. The vegetation was most luxuriant, approaching in character to that of Europe. After an interesting march of 13 miles, we reached Aliu amba, a large straggling village built near the extremity of a spur from the range near Ankóbar, having a small stream running through the valley at its foot. By thermometrical observations it was determined to be 5271 feet above the level of the sea. Aliu amba is inhabited chiefly by the Mahomedans, and is the principal mart for slaves to which the Danákil dealers resort, an extensive market being held here every Friday.

On our arrival we were lodged in a wretched, barn-like house, and were detained here until the 1st of August, when the mission proceeded to meet the king of Shwá.

August 4th.—Ankóbar, 6 miles westerly, 2 hours. Road mountainous and steep; water abundant and good; forage scarce.

The road from Aliu amba to the capital winds to the westward, with a very steep ascent in parts, for about 6 miles to the summit of the high range of mountains which run from N. to S. Ankóbar is built on two wooded hills; the northern one strongly palisaded, being exclusively occupied by the residence of the king and its numerous out-buildings; the southern thickly clustered with houses, forming the capital of the kingdom of Shwa. Ankóbar,

by the means of Lieutenant Barker's observations, was determined to be in lat. $9^{\circ} 34' 33''$ N., and by the protracted route is placed in long. $39^{\circ} 35'$ E. The boiling-point of the thermometer gives an elevation above the level of the sea of 8198 feet, corroborated by the mildness of the climate, the thermometer during August and September never having risen above 63° , and 46° having been the minimum.

Total—days' marches, 36 ; miles, 372 ; hours, 174.

VIII.—*Extract Report on the probable Geographical Position of Harrar ; with some Information relative to the various Tribes in the Vicinity.* By Lieutenant W. C. BARKER, I.N., attached to the Mission to Schwá.

SHORTLY after our arrival at Tajurra, a subject of the king of Shwá, Romeat Ullah by name, anxious to return to his native country, accompanied the mission as a horse-keeper. He gave me the following account of Harrar, together with a narrative of his journey thither, and thence to Zeilah, which I relate in his own words.

"I am a native of Guburuah, a village situated about 2 miles to the N.E. of Aliu amba. About seven years ago I left my native country with a kafila of about 200 asses, these animals being used in preference to camels. The people of the kafila were principally natives of Harrar: they had many slaves with them.

"We quitted Kuldás, a village about 14 miles to eastward of Ankóber (whither the Harrar kafila always resort), in the month of June. At the end of the second day's march we arrived at the banks of the Hawásh; crossing which we filled our water-skins, and proceeded two days without finding water. On the morning of the third day we came to a watering-place called Sirke or Sirge, where there are hot-springs. The third day after quitting these springs we arrived at Errur, situated in a place at the foot of the Galla hills, where there is a wadi with excellent water."

The road thus far he described as passing through an uncultivated country, inhabited by wandering tribes of the Adáil, who subsist by plunder;—woe to the unfortunate straggler in these parts, for he is sure to be cut off. The Adáil in general bear anything but a good character; they are described as being exceedingly ferocious and bloodthirsty. For fear of them the kafila made two marches daily, or about 15 miles, until it arrived at Errur.

Errur is a place much resorted to by the surrounding tribes,